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Activities of the International Atomic Energy Agency Relevant to Article IV of the Treaty on the Non-Proliferation of Nuclear Weapons

EXECUTIVE SUMMARY

The International Atomic Energy Agency (IAEA) was established in 1957 to be the global intergovernmental organization for international co-operation in the peaceful uses of atomic energy. It is an independent organization within the United Nations family with 130 Member States.

While the IAEA is not referred to in Article IV of the NPT, under its Statute it in fact plays a major role in the organization and implementation of the multilateral co-operation stipulated by the Treaty. The Statute authorizes the IAEA, for peaceful purposes to — inter alia — encourage and assist research on, and development and practical application of, atomic energy; make provision for materials, services, equipment and facilities for atomic energy research and development; foster the exchange of scientific and technical information, and encourage training; and establish and administer safeguards.

The paper describes how, in line with its Statute and with decisions of its Policy-making organs, since 1979 the IAEA has placed increasing emphasis on technology transfer, with priority given to developing Member States. Both the Regular Budget of the IAEA and its Technical Co-operation Fund (TCF) are used for this purpose. The TCF funds the Technical Co-operation programme, which comprises national, or country, projects, and regional and inter-regional projects. They cover a wide spectrum of the IAEA's activities, for example those in nuclear, radiation, waste and transport safety and in nuclear energy, and also nuclear applications in medicine, agriculture, environment, hydrology and industry.

Resources for this technology transfer, which had increased in past decades, have levelled off in the past five years. At the same time, the IAEA's membership increased from 122 in 1995 to 130 in 1999, which in practical terms signifies a reduction in the capacity to respond to the increasing needs of its Member States. Much has been accomplished, but much more remains to be done to make the benefits of nuclear energy widely available for sustainable development, for environmental protection, for human health and for generally improving the quality of life. Opportunities exist and projects responding to the real needs of Member States have been identified, the only constraint being the level of resources available. The unpredictability of resources for the TCF makes it difficult to programme activities. Indeed, over the last few years, some major donors pledged only a part (20%—80%) of their respective targets, while some recipient countries did not pay at all. The General Conference of the IAEA has often stressed the need to strengthen TC activities, partly through the provision of sufficient resources, and has urged all Member States to make every effort to pay their contributions to the TCF in full and on time. In this respect, the provisions of Article IV.2 are relevant and should be seriously considered by the States Party to the NPT at this Review Conference.

The paper concludes by examining the challenges to technical co-operation, and how the IAEA has developed a Medium Term Strategy (2001-2005) to meet those challenges. In this Strategy the objectives for the medium term are grouped under three substantive goals, or pillars, and two complementary functional goals. They address the contribution of nuclear technologies to meeting the needs and interests of Member States in a sustainable manner; promoting an effective worldwide safety culture, and providing assurances to the international community of the peaceful uses of nuclear material.

The IAEA is thus expected, through its Medium Term Strategy, to strengthen its role as the principal international vehicle for multilateral co-operation in the peaceful uses of atomic energy, maintaining and enhancing its relevance to Article IV of the NPT.

I. INTRODUCTION

The International Atomic Energy Agency (IAEA) was established in 1957 as an independent organization within the United Nations family, to be the global intergovernmental organization for international co-operation in the peaceful use of nuclear energy. The twin objectives of the IAEA are: (i) to enlarge the contribution of atomic energy to peace and development at a high level of safety, and (ii) to ensure, so far as it is able, that atomic energy is utilized exclusively for peaceful purposes.

The IAEA now has 130 Member States.

As the needs and priorities of the IAEA Member States are diverse, the IAEA deals with the whole spectrum of peaceful uses of nuclear energy, ranging from production of electricity through nuclear power to the application of radiation and isotopes in such areas as human health, food and agriculture, industry, water resource management and environment, thus affecting all aspects of human development.

Priority within the IAEA's activities is placed on the transfer of nuclear technology and techniques to Member States, with emphasis on developing countries. Many ways and means are used to this end under its regular programme, including scientific and technical meetings and publications, research contracts and programmes, numerous databases, and a wide range of services by advisory teams and research laboratories. The majority of the IAEA technology transfer activities, however, are undertaken through the technical co-operation (TC) programme, funded by voluntary contributions, which assists developing Member States in meeting their most pressing scientific and technical needs for development.

A number of steps have been taken by the IAEA in recent years to strengthen its technology transfer efforts by improving its efficiency and effectiveness. This paper presents an overview of the IAEA's technology transfer activities and briefly comments on the link between these activities and the commitments made under Article IV by the parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The following sections contain a description of the relationship between Article IV of the NPT and the activities of the IAEA and the evolving framework for the IAEA activities to promote peaceful nuclear co-operation, with a special section devoted to developments since 1995. The last section focuses on the challenges to peaceful co-operation as described in the medium term strategy of the IAEA for 2001-2005.

II. INTERNATIONAL CO-OPERATION FOR THE PEACEFUL USES OF NUCLEAR ENERGY: THE NPT AND THE IAEA

A. NPT Article IV

Article IV of the NPT states:

1. "Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty."

2. "All the parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also co-operate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States party to the Treaty, with due consideration for the needs of the developing areas of the world."

B. Responsibilities of States Parties

As such, Article IV of the NPT stipulates two main provisions. First, it confirms the right of all the parties to the Treaty to conduct peaceful nuclear activities and to participate in peaceful nuclear co-operation. Second, the Article provides for the obligation of the parties to facilitate the fullest possible exchange of equipment, materials, scientific and technological information and co-operate in contributing to the further development of the peaceful uses of nuclear energy. Particular emphasis is placed on the development of peaceful nuclear applications in non-nuclear-weapon States party to the NPT.

C. Role of the IAEA: The Statute

Although the Agency is not referred to in Article IV of the NPT, it plays a major role in the organization and implementation of the multilateral co-operation stipulated by the Treaty. The importance of the work of the IAEA as the principal agent for technology transfer among international organizations referred to in Article IV.2, was acknowledged by the 1995 NPT Review and Extension Conference. The document of this Conference, NPT/CONF.1995/32/DEC.2 of 11 May 1995 entitled 'The Principles and Objectives of Nuclear Non-proliferation and Disarmament' states that:

> "Every effort should be made to ensure that the IAEA has the financial and human resources necessary in order to meet effectively its responsibilities in the areas of technical co-operation, safeguards and nuclear safety. The IAEA should be encouraged to intensify its efforts aimed at finding ways and means for funding technical assistance through predictable and assured resources."

Under its Statute, the IAEA's principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world". To this end, the IAEA is authorized to discharge a number of functions, including the following:

1. "To encourage and assist research on, and development and practical application of, atomic energy for peaceful uses throughout the world; and, if requested to do so, to act as an intermediary for the purposes of securing the performance of services or the supplying of materials, equipment, or facilities by one member of the IAEA for another; and to perform any operation or service useful in research on, or development or practical application of, atomic energy for peaceful purposes;

2. To make provision for materials, services, equipment and facilities to meet the needs for research on, and development and practical application of, atomic energy for peaceful purposes, including the production of electric power, with due consideration for the needs of underdeveloped areas of the world;

3. To foster the exchange of scientific and technical information on peaceful uses of atomic energy;

4. To encourage the exchange and training of scientists and experts in the field of peaceful uses of atomic energy;

5. To establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the IAEA or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State's activities in the field of atomic energy."

Over the years, some of the foregoing statutory provisions were further built upon and detailed. In 1979, the Board of Governors approved "The Revised Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the IAEA", which reflected the experience accumulated by the IAEA in this area. The document emphasized *inter alia* that:

1. The provision of technical assistance constitutes a major, high-priority function of the IAEA, and responsibility for its success devolves on all Departments of the Secretariat.

2. Increasing emphasis shall be given by the IAEA to the provision of technical assistance with regard to integrated, multi-year programmes, including projects for regional development. These programmes or projects should be related to the development plans or priorities and objectives of the recipient Member States or group of Member States with a view to making a contribution in support of them.

The aforementioned statutory provisions and subsequent decisions of the Board of Governors underlie the "Revised Supplementary Agreement concerning the Provision of Technical Assistance by the International Atomic Energy Agency" (RSA) which all recipient Member States

must conclude with the IAEA. This supplementary agreement reinforces the commitment of these Member States to non-proliferation.

III. THE EVOLVING FRAMEWORK FOR PROMOTION OF PEACEFUL NUCLEAR CO-OPERATION

A. IAEA infrastructure, nuclear centres and laboratories

For effective promotional activities, the IAEA must monitor the trends and developments in nuclear science and technology worldwide, as well as the prevailing needs and priorities of Member States. The IAEA conducts comprehensive reviews of its programmes with a view to identifying their strengths and weaknesses. The latest such review was undertaken in 1998 in connection with the elaboration of the Medium Term Strategy for 2001-2005. In addition, since 1982 Technical Co-operation Review Seminars have been held at an interval of 4-5 years where all IAEA Member States can present their views and proposals on principal issues related to TC activities. In many cases, such reviews and discussions have resulted in adjustments of the IAEA's strategy, priorities and programmes and in attendant modifications of its organizational structure.

At present, the IAEA Secretariat is composed of six Departments. Four are directly involved in the transfer of peaceful nuclear technology worldwide. The overall administration and management of technical co-operation programme is carried out by the Department of Technical Co-operation. Its functions include the whole range of organizational and financial matters related to the planning and implementation of the programme; forging a link between national development goals of recipient countries and the IAEA's assistance; communication and interaction with national authorities in developing Member States on TC matters; and overall performance and improvement of TC activities.

The other Departments' involvement in the TC programme includes scientific and technical aspects of country programming, technical appraisal of project requests, scientific and technical supervision of project implementation, and other tasks aimed at ensuring the technical integrity of inputs and the technical quality of the programme. In addition to their input to the TC programme, the Technical Departments conduct, under their own programmes, extensive activities directed at nuclear science and technology transfer to Member States. A number of mechanisms have been developed and used to this end, including co-ordinated research projects (CRPs), research contracts, seminars and workshops, the collection and dissemination of scientific and technical information through the International Nuclear Information System (INIS) and various databases, the preparation of safety standards, the provision of advisory services, and other means of exchange of knowledge and skills between scientists and engineers from all IAEA Member States, regardless of the level of their nuclear development.

Uniquely among other international organizations of the UN family, the IAEA operates its own research and service laboratories, which contribute significantly to the transfer of nuclear technologies. For nearly 40 years, the IAEA's Seibersdorf Laboratories, near Vienna, have carried out research and provided a diverse range of technical services in applied physics, chemistry, hydrology, agriculture, and nuclear instrumentation.

Hundreds of scientists from developing countries benefit every year from the activities of the International Centre for Theoretical Physics (ICTP) in Trieste, Italy, which is financed jointly by the Italian Government, UNESCO and the IAEA, with additional funds from other sponsors. The centre serves both as a research facility and a scientific training centre. The IAEA's main objective in ICTP's activities is to foster the growth of advanced studies and research in physical and mathematical sciences and their interface with technology, especially in developing countries.

Since 1961, the IAEA has operated a Marine Environment Laboratory in Monaco which carries out research and training in marine science, particularly in environmental monitoring and in the study of radioactive and non-radioactive pollutants in oceans and seas. The laboratory frequently collaborates with oceanographic institutes worldwide and undertakes projects in co-operation with other international environmental programmes and institutions.

B. Financial resources and personnel

The IAEA financial resources consist of two major components: the Regular Budget and the Technical Co-operation Fund (TCF). The Regular Budget provides for the administrative expenses of all Departments of the IAEA, including the Technical Co-operation Department, as well as for activities carried out under the regular programme in the interest of all Member States, both industrialized and developing. The Regular Budget is funded by contributions made according to a formula of annual assessment applied to each Member State, calculated essentially according to the rates used in the UN system for assessed contributions. Safeguards expenses are included in the Regular Budget, although a special formula, designed to minimize costs to developing countries, is used for purposes of assessment. Figure 1 shows the regular programme resources available during the period 1995-1998. The TCF was established to finance all components delivered by the IAEA to developing countries under the TC programme and is made up of voluntary contributions paid by Member States (see subsection D below).

In addition to the Regular Budget and TCF, the IAEA receives extrabudgetary contributions from its Member States and some international organizations for funding specific projects within the TC programme and other programmes.

Over the years, the IAEA has built up significant human resources to enable it to cope with the growing size and diversity of technology transfer to developing Member States. The managerial and technical staff dealing with these activities are qualified and dedicated specialists with substantial experience in the international transfer of technology and know-how. Many of them come from developing countries, bringing with them knowledge of prevailing conditions and needs in those regions.

As of the end of 1999, IAEA staff numbered 2,196, of whom 940 were in the Professional and higher categories.

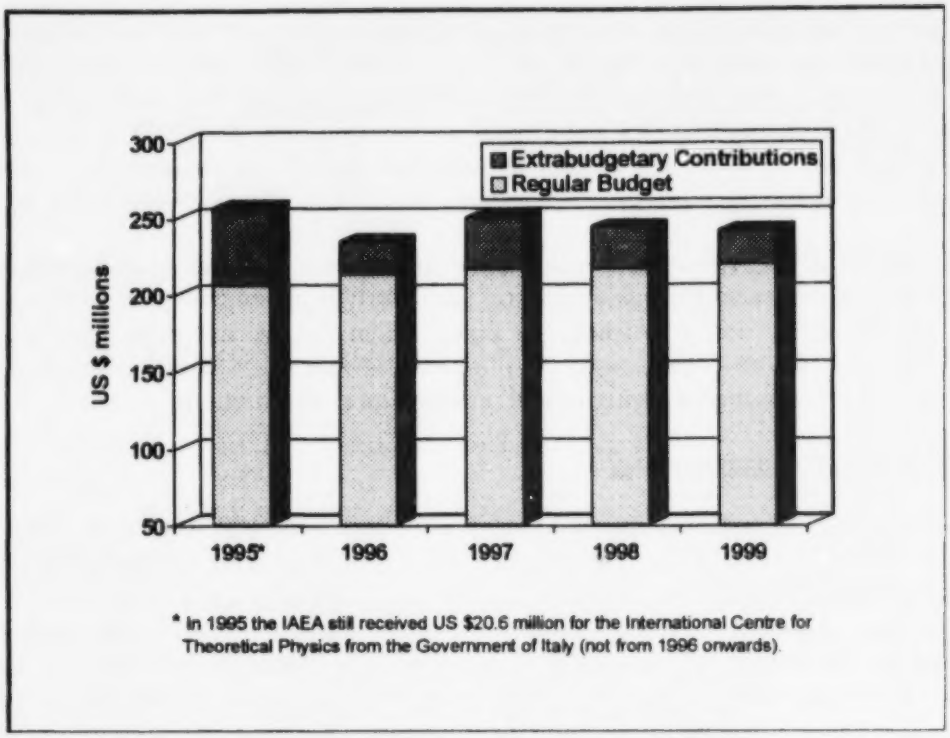

Figure 1. IAEA regular programme resources: 1995 - 1999.

C. Technical co-operation

The IAEA's major instrument for co-operation with developing countries is the TC programme. It comprises national projects (also known as country projects), regional projects and interregional projects. Projects may include one or more of the following components: expert services, provision of equipment and materials, fellowship training, scientific visits and training courses. A national project derives from a formal request for technical assistance by a Member State and forms part of the Member State's country programme of co-operation with the IAEA. Regional projects are (i) those proposed by the IAEA in response to the expressed needs of two or more Member States in a region, and (ii) those proposed by Member States in a region collaborating within a regional co-operative agreement. Interregional projects are established by the IAEA to serve the common needs of several Member States worldwide. In particular, some interregional projects are used to fund missions to any Member State that seeks assistance in planning its technical co-operation with the IAEA or in assessing needs for nuclear applications.

The TC programme is submitted for consideration and approval by the Board of Governors. Since 1989, the IAEA has applied a system of multi-year TC programmes with annual budgetary approval.

In 1999, 868 TC projects, including interregional and regional projects, were operational in 95 Member States, covering all areas of the peaceful application of nuclear energy. Under these

projects, over 3,300 experts including lecturers from all over the world conducted visits to recipient Member States, and 55% of these visits were carried out by experts from developing countries, which is an indicator of the advancement achieved by many developing Member States. Over 1,200 persons received training as fellows or visiting scientists. Fourteen interregional and 184 regional training courses were held in 65 countries; 82% of these courses were hosted by developing countries. Another 2,400 persons were trained at the courses. Various items of equipment and instruments totalling US $30 million were delivered. Figures 2 and 3 show disbursements by field of activity and a regional breakdown of the TC programme for 1998.

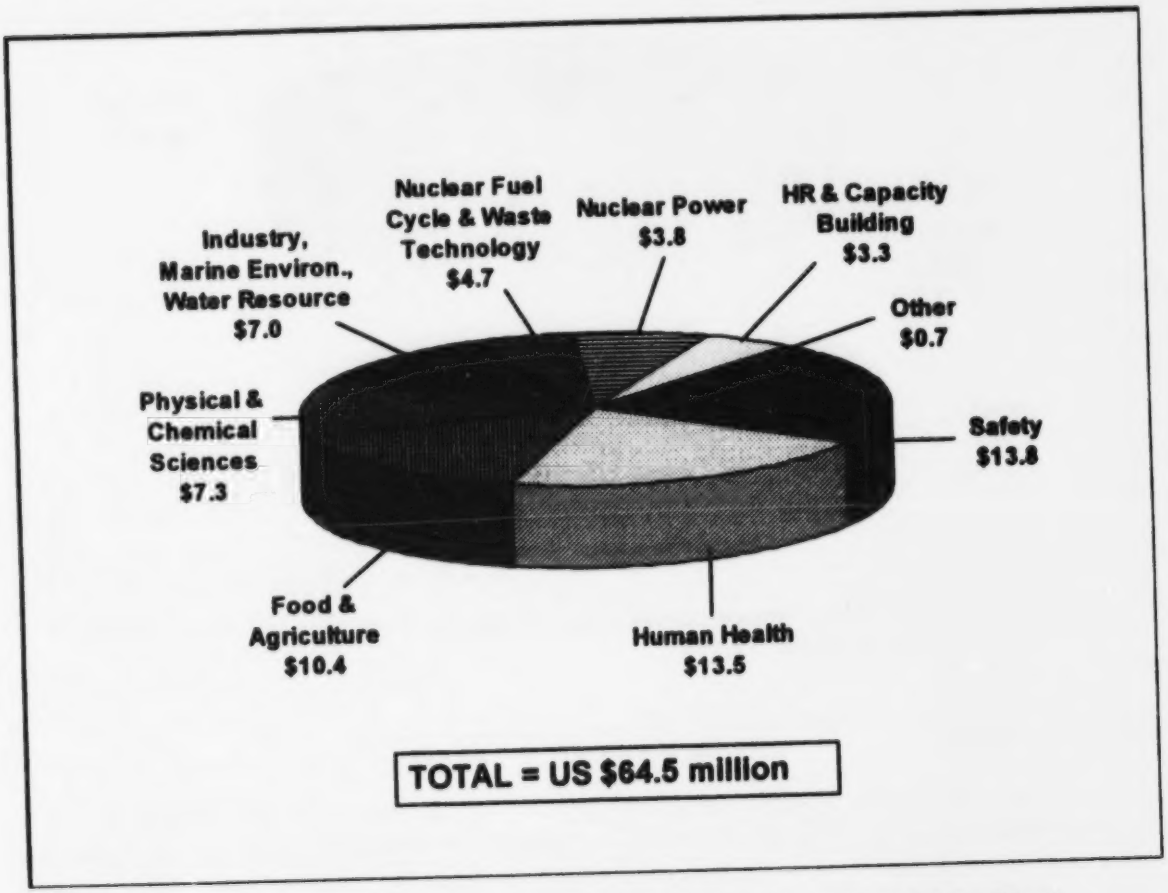
Nuclear Fuel Cycle & Waste Technology $4.7
Nuclear Power $3.8
HR & Capacity Building $3.3
Industry, Marine Environ., Water Resource $7.0
Other $0.7
Physical & Chemical Sciences $7.3
Safety $13.8
Food & Agriculture $10.4
Human Health $13.5
TOTAL = US $64.5 million

Figure 2. Technical co-operation disbursements by field of activity: 1998 (in US $ millions).

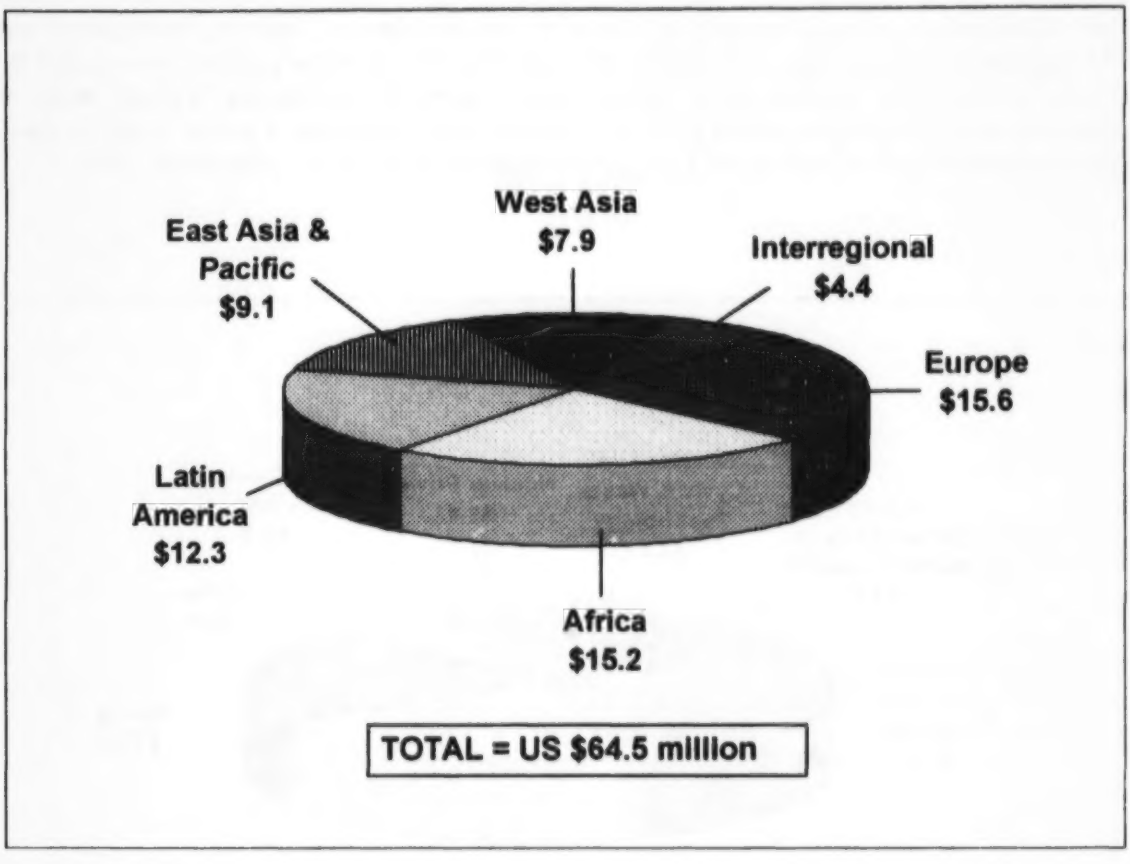

Figure 3. Technical Co-operation disbursements and Member States' participation by region: 1998 (US $ millions).

D. TC funding

As noted earlier, the administrative costs required for running the TC programme and its in-house technical support are borne by the Regular Budget. The cost of TC project components and their delivery is funded from voluntary contributions provided by Member States. Most of these voluntary contributions are paid into the TCF, accounting for over 85% of total resources available for the TC programme. The annual target for payments into the TCF is set for two years in advance following consultations among Member States. At the General Conference, Member States are requested to pledge contributions against their share of that target, calculated essentially according to the rates used in the UN system for assessed contributions. The other principal source of income for the TCF is Assessed Programme Costs (APC), which are levied on individual Member States at 8% of assistance received and paid back to the IAEA.

Guided by an annual estimate of available TCF resources, the Board of Governors approves the allocation of funds to projects according to priorities determined by the IAEA Secretariat following discussions with Member States.

A number of projects that cannot be funded from the TCF owing to lack of resources (typically 25-30% in funding terms) are approved for implementation subject to subsequent availability of funds which may be provided through extrabudgetary contributions ("footnote a/ projects"). Another type of extrabudgetary contributions is "assistance in kind", whereby Member States provide expert services, donate equipment or arrange training free of charge. Some 20% of all fellowships provided annually under the TC programme are funded from this source.

Figure 4 shows resources available (adjusted for inflation) for the TC programme in 1989-1998.

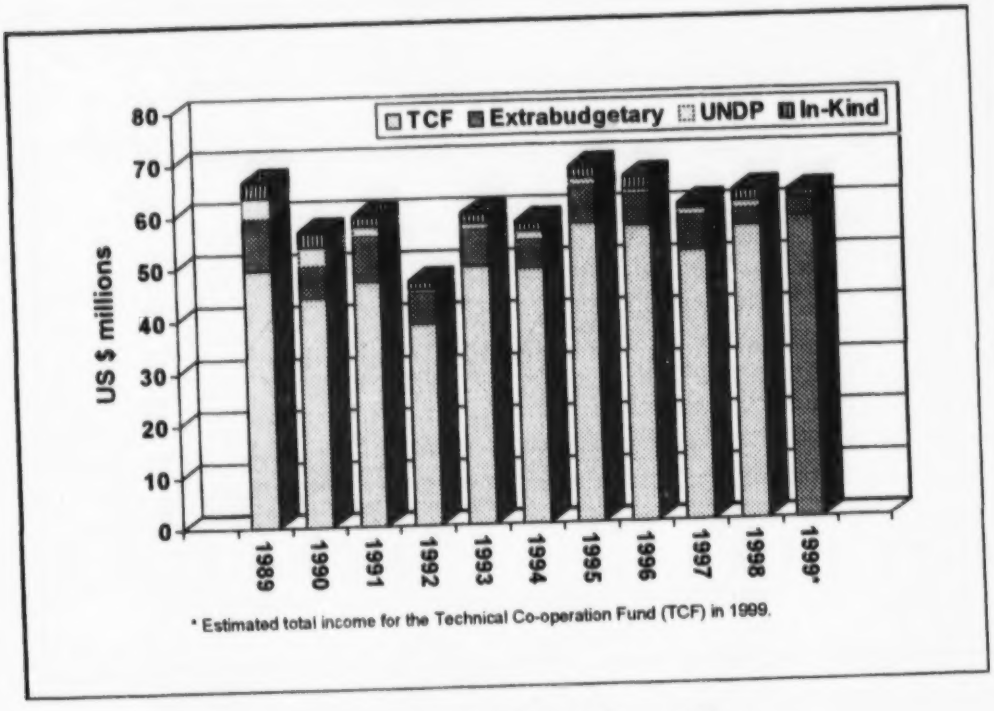

Figure 4. TC resources adjusted for inflation: 1989 — 1998.

A record number of 73 countries, 13 more than in 1997, made pledges to the TCF in 1998. Most of the newly pledging countries were among developing Member States, including least developed countries. The 20 largest contributors to the TCF (15 developed and five developing Member States) represent 95% of the payments for 1998. At the same time, 55 Member States neither pledged nor paid contributions to the TCF. Figure 5 shows the development of pledges and payments to the TCF during the period 1985-1998. It can be seen that during this period there was a continuous gap between the approved target for the fund payments and the actual payments.

Although the situation improved somewhat between 1992 and the time of the NPT Review and Extension Conference in 1995, since then the income as a percentage of the target has decreased again. At the same time the increase in the Agency membership from 122 in 1995 to 130 in 1999 signifies in practical terms a reduction in the capacity to respond to the increasing needs of its Member States. The unpredictability of resources for the TCF (see Figure 5) makes it difficult to programme activities. Indeed, over the last few years, some major donors pledged only a part (20%—80%) of their respective targets, while some recipient countries did not pay at all.

The General Conference of the IAEA has often stressed the need to strengthen TC activities, including the provision of sufficient resources, has urged all Member States to make every effort to pay their contributions to the TCF in full and on time, and has reminded Member States of their obligation to pay their Assessed Programme Costs (APC).

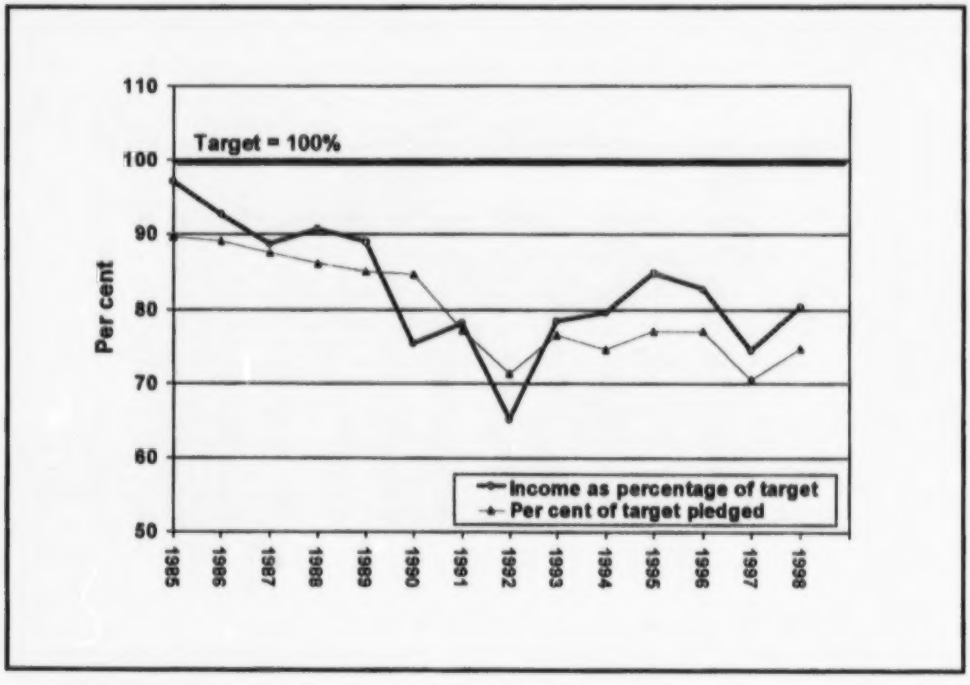

Figure 5. Pledges and payments to the Technical Co-operation Fund: 1985 - 1998.

E. TC and the NPT

While transfer of technology in the context of Article IV of the NPT also takes place through bilateral and other multilateral channels, the IAEA serves as the key international mechanism for scientific and technical co-operation in the peaceful uses of nuclear energy and has an important role in the transfer of nuclear technology to the developing areas of the world.

All TC project requests presented by Member States are appraised by the IAEA exclusively against statutory and other established criteria, including technical and practical feasibility, national

developmental priorities, availability of required infrastructure in the recipient country, and long term benefit to end users. As noted above, most of the projects deemed to be qualified for assistance are funded from the TCF. The remaining qualified projects, for which funding from the TCF is unavailable, are incorporated in the proposed TC programme as candidates for extrabudgetary support (footnote a/ projects). Such support is traditionally provided by donor countries.

F. TC strategy

Since the very early years of the IAEA's existence, its TC activities have undergone various adjustments and modifications reflecting new trends and developments in nuclear science and technology worldwide, changing needs and priorities of developing Member States, growing diversity and size of the TC programme, and other factors.

A number of new concepts and approaches have been introduced in TC planning and implementation practice at various times. Through these initiatives, the IAEA has been able to improve efficiency in the transfer of nuclear technology and techniques to developing Member States. The cumulative effect of these efforts on the technical capability of recipient countries is significant. This, combined with the desire of Member States to further strengthen the efficiency and effectiveness of technology transfer activities, has created greater opportunity for projects in the development areas. To encourage this trend, it has been necessary to focus the resources available for technology transfer on activities which are both cost effective and aligned with national development priorities.

That has brought about a gradual shift in emphasis in the IAEA's TC programme in the last four years from infrastructure building activities towards collaboration with counterpart organizations to employ the available capacity for development projects.

The major goal of the new **Technical Co-operation Strategy**, approved by the Board of Governors in December 1997, can be stated as follows: Technical co-operation with the Member States shall increasingly promote tangible socioeconomic impact by contributing directly in a cost effective manner to the achievement of the major sustainable development priorities of each country. This goal is conveyed by the term **Partners in Development**, the idea being that the IAEA becomes a partner with each Member State, co-operating in the process of achieving sustainable development. Three principal tools are utilized to achieve the strategic goal: Model Projects; country programme frameworks (CPFs); and thematic plans.

The **Model Projects** elaborated by the IAEA and introduced in 1994 may be national, regional or interregional. In comparison with other TC projects, Model Projects emphasize (i) responding to a high priority national need; (ii) a major role being played by nuclear technology; (iii) significant and measurable end-user/end-beneficiary impact; (iv) much greater government commitment; and (v) sustainability beyond the life-cycle of the project itself. Model Projects form the core of the IAEA's TC programme being, for example, the central element in planning country programmes within the CPF. Furthermore, because of their success rate, the new strategy calls for Model Project standards to be extended to the entire TC programme. By 1999, 122 Model Projects were operational in 59 Member States.

A **country programme framework** is a document agreed on between a country and the IAEA, outlining their joint concept for future co-operation. The CPF focuses on the medium term (four to six years) and is regularly updated. It provides a total overview of the country's needs for nuclear technology and serves to ensure that the IAEA's collaboration with the country is coherent and cost effective.

To be effective, the CPF must become an integral part — and eventually the principal means — of the national process of formulating and screening projects. The CPF process, already introduced during the preparation of the TC programme for 1997-1998, was applied to all Member States during the preparation of the 1999-2000 TC programme.

The second main pre-programme activity is **thematic planning for technical co-operation.** Thematic planning is a management tool for identifying those nuclear techniques which are unique or of special value in relation to the IAEA's mandate. A thematic plan should indicate (i) how IAEA expertise can contribute to solving a problem or to achieving a development objective, especially when compared with non-nuclear alternatives; (ii) in which countries or regions its application would be most appropriate; (iii) in which countries the ability to employ the services or applications exists, or can be readily created at reasonable cost. A strong link can be made between thematic planning and regional programmes. While thematic planning can result in national project activities, it can also help establish common regional strategies and opportunities for technical co-operation among developing countries (*TCDC*).

TCDC continues to be a key area because it strengthens the sustainability of project activities by building self-reliance and mutual interest among Member States. The most successful mechanisms established to stimulate TCDC are undoubtedly the Regional Co-operative Agreements for Asia (RCA), for Latin America (ARCAL) and for Africa (AFRA). The IAEA is trying to strengthen these regional endeavours by encouraging Member States to assume responsibility for project formulation activities, and by encouraging the more advanced national institutes within a region to contribute fully to solving problems within the region. Originally, such national institutes were referred to as **"centres of excellence".** However, given the way the concept is evolving, a more accurate term would be **"regional resource centres".**

The intensive efforts made by the IAEA and its Member States in recent years to strengthen TC activities have begun to bear fruit. More and more projects are aligned with recipient countries' priorities for economic and social development. This has been achieved by an increased emphasis on pre-project planning and consultations with Member States. Consequently, the IAEA is gaining a much higher profile not only with nuclear authorities but also with the heads of central government departments and ministers.

Consultations have also involved other potential partners and donors. For example, the European Union, the World Association of Nuclear Operators (WANO) and the G-24 participated in the planning of TC safety related activities for Eastern Europe and for the newly independent states (NIS) of the former USSR. This has led to increased funding for specific activities beyond that provided solely by the IAEA, and to greater co-ordination of multilateral efforts for the benefit of recipient States.

The total number of operational TC projects has been significantly reduced from nearly 1,200 projects in 1995 to slightly over 900 in 1998 and to 700 in 2000. Another interesting aspect is the growing trend towards "regionalization" of the TC programme, which means implementation through institutions within a region, using existing regional capacity and expertise whenever possible and thus promoting TCDC. In Africa, for example, while the budget for national TC projects has changed little in the past five years, allocations for AFRA and other regional projects have increased considerably, from about one quarter of the total programme budget in 1993 to over half in the TC programme for 1999-2000.

IV. PROMOTION OF PEACEFUL NUCLEAR CO-OPERATION: DEVELOPMENTS SINCE 1995.

A. Nuclear Technology Pillar

1. Nuclear power and the fuel cycle (including radioactive waste)

Global energy demand is growing as a result of economic development and increases in world population; for developing countries the demand is projected to increase two to threefold in the next thirty years. Nuclear power is one of the few options that can help countries in the next few decades to meet large scale electricity demand without releasing common environmental pollutants and greenhouse gases.

Today nuclear power is at a standstill in Western Europe and North America although it continues to expand in a few rapidly developing countries in Asia and parts of Eastern Europe. Accordingly, the proportional share of nuclear power in global electricity production is expected to fall in the next two decades. A resurgence of nuclear power depends on action on three crucial fronts: (i) continued improvement in its global safety record, including improvement in waste management; (ii) further improvement in its economic competitiveness; and (iii) restoration of public confidence.

While the choice of a particular energy mix is a national decision that can be made only in the light of national conditions and priorities, States considering the different energy options should be able to make that decision on the basis of up-to-date and complete information and with the benefit of technical expertise. In this context and in co-operation with eight other international organizations, the IAEA has continued its activities to assist Member States in developing their capacity for decision making in the energy sector. To that end, the IAEA's **nuclear power programme** has established country and technology databases, developed analytical computer tools, and provided training and support to developing countries in conducting comparative assessment studies, which make it possible to evaluate the perpetual trade-offs between technical, economic and environmental features of different electricity generation technologies, chains and systems at the national, regional and interregional levels. Currently, over ninety countries are using these tools, and more than 25 Member States have developed their own country databases containing a total of more than 2,500 technologies.

Under the programme, during the period 1995-1999 several international and regional conferences and seminars were organized and a number of technical documents dealing with

nuclear power planning and implementation were prepared by the IAEA. Of special interest to developing Member States was the publication of the following two documents: "Choosing the nuclear power option: Factors to be considered", and the report to the 43rd General Conference of the IAEA from the 2nd Scientific Forum on "Sustainable Development: A Role for Nuclear Power?".

The IAEA has also continued to provide Member States with information on the operation of nuclear power plants (NPPs) worldwide. In 1996, the Power Reactor Information System (PRIS) database was made available on the Internet, providing easier access to this information resource for the statistical analysis of NPP operation indicators. The number of PRIS users in 54 Member States and eight international organizations has increased to 280, representing a growth of 25% over the previous year.

A number of meetings have been held and a series of technical documents have been published by the IAEA on various aspects of **NPP performance**. They cover, in particular, NPP organization and staffing for improved performance, advanced methodologies used for training and qualification of NPP personnel, technical support for nuclear power operation, and good practices of some of the world's most productive plants.

Considerable efforts are being made worldwide to develop **advanced NPPs.** Expenditures for development of new designs, technology improvements, and the related research for the major reactor types combined are estimated to exceed US $1.5 billion per year. Within the framework of its nuclear power programme, the IAEA has continued to serve as an international clearing house for objective reference information on different concepts being developed and project status, as well as on typical development trends throughout the world. In this context, the IAEA plays a role in bringing together experts for a worldwide exchange of information on national programmes and for programme co-ordination of research on advanced reactor technology. For these activities, the IAEA relies on the advice of international working groups composed of leading representatives of national programmes and international organizations for each major type of reactor. Significant results of such meetings are published as technical documents and distributed to all interested organizations and individuals in Member States.

Among various types and new concepts of nuclear reactors, **small and medium size reactors**, which are of particular interest for such applications as the desalination of sea water and district heating, have continued to receive the IAEA's close attention. They may also be a suitable option for electricity generation in countries with small electricity grid capacities or in remotely located areas.

The IAEA's programme on the **nuclear fuel cycle** covers several key areas: uranium supply and demand, reactor fuel technology and performance, spent fuel management, and nuclear fuel cycle issues, including the safe handling and storage of plutonium and comparative assessment of the different options for the back end of the fuel cycle.

Some major assessments and their implications have emerged from this programme. The supply of uranium for nuclear power reactors will be sufficient to satisfy world needs up to the year 2050. Since delays are expected in the availability of high level waste and spent fuel

repositories, prolonged storage of spent fuel and conditioned high level waste is anticipated. However, technologies are available for safe storage and disposal of spent reactor fuel or radioactive waste. Also, a significant quantity of separated civil plutonium, which can be used for fueling power reactors, has been accumulated in the nuclear fuel cycle industry.

The IAEA's **waste management** activities are not limited to spent fuel and conditioned high level waste, but also deal with operational waste from nuclear power and its fuel cycle, and with radioactive waste from many other different sources. The majority of the IAEA's Member States do not have nuclear power programmes and use radionuclides principally for research, and for medical, industrial, and agricultural applications. Over the past decades, the technologies to effectively manage small amounts of radioactive wastes generated from non-power applications have been developed and implemented. Still, there are Member States where the available infrastructure is either inadequate or missing. In view of this, at present almost half of the IAEA's ongoing waste technology tasks are oriented to non-fuel cycle wastes. The main objective is to identify the best ways and means to transfer demonstrated technologies and associated experience to all countries, especially to developing IAEA Member States.

As for direct technology transfer, under the TC programme for 1998 a total of 110 projects in nuclear power and fuel cycle were operational, including regional and interregional activities. The disbursements for these projects amounted to nearly $ 8.5 million or 13% of total TC expenditures. The majority of these projects dealt with radioactive waste management and disposal (35%) followed by projects in nuclear power implementation and performance (33%) and raw materials for reactor fuels (15%).

2. Non-power applications of nuclear energy

The IAEA has continued co-operation with the overwhelming majority of its developing Member States in the use of radioisotopes and ionizing radiation for research, agricultural, medical, industrial and other non-power applications.

In the area of **food and agriculture,** emphasis is placed on facilitating the development and adoption by Member States of nuclear and related biotechnologies which enhance the ability at national and international levels to identify and alleviate constraints to sustainable food security. This activity is conducted jointly with the Food and Agricultural Organization (FAO).

The programme assists Member States in defining specific constraints and in finding solutions to problems in relevant areas earmarked for intergovernmental action at the United Nations Conference on Environment and Development and at the World Food Summit.

During 1998, nearly 180 projects in food and agriculture were operational under the TC programme, including one interregional and 15 regional projects. The disbursements for these projects accounted for 16% of total TC expenditures. The following examples illustrate some results obtained in the area of food and agriculture. About 125 new varieties of crops were developed by induced mutations to improve productivity in the past five years. Several Member States in Africa, Latin America and Europe have been very successful in the control or eradication

of insect pests by Sterile Insect Technique (SIT), and rinderpest has been almost eradicated from Africa.

In **human health,** IAEA activities are focused on nuclear medicine, clinical radiation therapy, dosimetry and medical physics, and on nutritional and health related environmental studies. In **nuclear medicine**, emphasis is placed on the introduction of cost effective application of many *in-vivo* diagnostic nuclear medicine procedures in routine medical practice in a large number of developing countries. More than 400 radioimmunoassay laboratories have received IAEA support. Molecular biology methods have been introduced in a number of centres. About 70 gamma cameras have been provided to 56 Member States and 150 existing analogue gamma cameras upgraded to digital ones. More than 700 nuclear medicine professionals have been trained. Over 200 national, regional and interregional training courses, workshops and seminars were organized during the past five years.

In **clinical radiation therapy**, the IAEA has been involved predominantly in selecting equipment, establishing training for all echelons of staff and identifying experts to start the first radiation oncology departments in four Member States. In **dosimetry** and **medical radiation physics**, major achievements have been the expansion of support to the IAEA/World Health Organization (WHO) network of secondary standard dosimetry laboratories: in particular, the calibration of brachytherapy, the development and dissemination of standards for diagnostic radiology, the development of a charter and the establishment of criteria for active membership of the network. Another major activity is quality audit of radiotherapy centres, involving promotion of national networks; there has been a substantial increase in the number of beams checked owing to the automation of thermoluminescent dosimetry procedures.

In the **environmental area, air pollution** — a serious problem in many parts of the world and particularly in developing countries — has been extensively tackled. It has been demonstrated that (i) nuclear analytical techniques are highly appropriate for determining the elemental composition of airborne particulate matter collected on filters and appropriately selected biomonitors, and (ii) chemometric evaluation of the multi-element data sets produced by these techniques enables identification of pollutant sources and their apportionment.

The TC programme for 1998 included 175 projects related to human health, of which one was interregional and 25 were regional. Disbursements for these projects amounted to US $13.5 million or 21% of total TC expenditures. More than two thirds of these projects dealt with nuclear medicine, and applied radiation biology and radiotherapy.

A very traditional and important area of activity has been the use of isotope and radiation techniques for various **industrial applications.** These include, in particular, non-destructive testing, radiation processing of industrial and medical products, treatment of wastewater and flue gases, and application of tracer techniques for the assessment, development and management of water resources. Assistance has also been rendered in utilization of research reactors and particle accelerators for research and production of radioisotopes for industrial, medical and other applications; monitoring and study of the marine environment; nuclear instrumentation; and radiochemical applications.

Another important activity has been the application of isotopes in **hydrology** which has significantly improved groundwater resource management and pollution prevention in many countries. Dam sustainability has also been improved by isotope techniques in several countries, bringing large economic benefits in the past five years. Radiation technology has proven to be efficient for cleaning flue gas from coal burning electric power stations; the IAEA has assisted four Member States with this technology.

In 1998, assistance to developing Member States in these areas was provided under 236 projects running to US $14 million, which represents 22% of the total disbursements under the TC programme.

B. Safety Pillar

Over the past five years, the IAEA has continued its activities to strengthen the global regime for nuclear, radiation, waste, and transport safety. The regime comprises three main components: legally binding agreements between States, internationally recognized safety standards, and measures to assist States in the implementation of these conventions and standards. In addition, technological solutions for improving safety are being promoted. In 1999, the IAEA also focused on assisting Member States to manage the Y2K readiness problem.

Since 1995 several safety related instruments have been concluded under the IAEA auspices, namely, the Convention on Nuclear Safety which entered into force in 1996; and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage which have yet to enter into force. Four other instruments which were negotiated under the IAEA auspices had already entered into force during the period before 1995, namely, the Convention on Early Notification of a Nuclear Accident (1986), the Convention on the Physical Protection of Nuclear Material (1987), the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1987) and, in the field of nuclear liability, the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (1992).

By its Statute, the IAEA is authorized to establish safety standards and provide for their application. Over the years, the IAEA, in co-operation with its Member States, has developed and issued more than 200 standards which represent international consensus on safety requirements and provide essential guidance for national authorities. They cover all areas where nuclear energy and radiation are used, including nuclear power and its fuel cycle, and various applications in research, medicine, industry, agriculture and other non-power sectors. Since 1996, a programme of work has been under way to revise and update some 70 safety standards. While the first portion of the revised documents has already been published, the majority of the revisions should be completed in 2000-2001 as a result of which a comprehensive and scientifically up-to-date corpus of standards will be available to Member States.

The key to an effective safety regime is the full application of conventions and standards at the workplace. Responsibility for the implementation of the conventions and the application of safety standards rests primarily with Member States. The IAEA, however, undertakes many

activities to assist countries in this endeavour. Throughout the past five years, the IAEA expanded the range of services it can offer in this area and is in the process of upgrading its services to include various types of safety review missions, training, the fostering of scientific research, technical co-operation, legislative assistance, and information exchange. In the past years, the number of Member States using the different safety services of the IAEA in such areas as operational and engineering safety of power and research reactors or the services to review regulatory approaches in nuclear, radiation and waste safety has considerably increased.

In recent years, a substantial number of safety related TC activities have been implemented under a TC Model Project on upgrading radiation and waste safety infrastructure, which is based on achieving the standards required by the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS). The project is designed to establish and strengthen the national safety infrastructure of States using radiation sources and radioactive materials for medical, industrial and research purposes. Particular emphasis has been placed on the basic infrastructure elements, such as establishing legal frameworks for safety, creating and strengthening national regulatory bodies, providing initial education and training for safety professionals, and setting up national systems for the notification and control of radiation sources. As of the end of 1999, about 80% of the 52 States participating in the Model Project had legislation, regulations for regulatory authority and a system of notification, authorization and control of radiation sources approved or in the process of approval.

Under this Model Project, a variety of expert missions were undertaken according to action plans agreed on with the participating countries. Between 1995 and 1999, the IAEA conducted 302 expert missions and held 37 workshops and seminars covering most of the project activities.

In addition to this, the IAEA has continued its educational and training activities under the TC programme as an efficient mechanism for strengthening nuclear and radiation safety. Under the overall safety programme, about 170 national, regional and interregional training events were conducted between 1995 and 1999. Basic professional and postgraduate training courses in radiation protection and nuclear safety are still regularly held in various regions.

The safety related TC activities between 1995 and 1999 involved approximately US $72 million which represents about 25% of total TC disbursements in that period, with over 400 national, regional and interregional projects.

In recent years, an extrabudgetary project has been conducted under the regular programme on the main safety issues related to the design and operation of early generation NPPs in Eastern and Central Europe and the NIS. Its findings and recommendations have been used as technical bases for safety upgrading work at the plants in question, for review by national regulatory authorities and for the establishment of safety priorities in national, bilateral and other international programmes. As a result, considerable progress in nuclear safety has been achieved in the operation of WWER and RBMK reactors in Central and Eastern Europe, in strengthening the independence and technical competence of the nuclear regulatory authorities and in establishing a legislative and regulatory framework for national nuclear regulation. Notwithstanding the results accomplished, more remains to be done. For instance, further efforts are required to maintain and

enhance an effective safety culture and to improve design safety through specific safety analysis reports.

A regional extrabudgetary activity on the safety of nuclear installations in South East Asia, Pacific and Far East countries started in early 1998 under the regular programme. The objective of the activity is to strengthen nuclear safety in participating countries and, in particular, to enhance the capabilities of regulatory authorities and technical support organizations.

Significant inputs for the further development and promotion of nuclear and radiation safety are made through a wide spectrum of meetings ranging from international conferences and symposia attended by hundreds of participants to meetings of several experts or consultants. For example, the following conferences organized by the IAEA in 1998 are worth mentioning: The International Conference on Topical Issues in Nuclear, Radiation and Radioactive Waste Safety and the International Conference on the Safety of Radiation Sources and the Security of Radioactive Materials.

In the past five years, an area of continued concern in the debate over the use of nuclear technologies has been the safety of spent fuel and radioactive waste management. The concerns are associated with the wastes generated by nuclear power plants and the wastes from nuclear applications in medicine, agriculture and industry, but also with the considerable potential increase in the volume of the wastes from the envisaged decommissioning of a number of nuclear power and research reactors. Hence, there is an urgent need to develop and implement disposal plans. The IAEA has assisted Member States in this area, particularly through the development of consensus on safety standards. In some areas, such as the near surface disposal of low level waste, this consensus exists, but in others — for example, geological disposal of high level waste — it has been more elusive.

Over the past few years, a particularly urgent issue has been the threat to public health arising from 'orphan' radioactive sources. The IAEA has provided assistance to check the radiological impacts of these sources that are not under the control of national authorities and helped the national authorities to take the necessary protective measures, including emergency humanitarian assistance. The IAEA is now engaged in the implementation of a plan on the safety of radiation sources and the security of material, including the development of a possible best code of conduct for use by national authorities in this area.

Another area of growing concern has been the safety of research reactors: of the more than 600 research reactors which have been built, 344 have been shut down but only 106 have been decommissioned. Many States operating research reactors still have inadequate regulatory infrastructures, and there are also other serious issues such as ageing, obsolete equipment, lack of spare parts and budgetary constraints. The IAEA's activities in this area have focused on upgrading the regulatory structure and on safety review services. More needs to be done. In the future, additional IAEA efforts are envisaged to enhance operational safety through the completion of a safety requirements document for research reactors; the increased use of advisory missions; the development of guidelines for peer reviews and self assessments; and the provision of assistance in enhancing the safety of ageing research reactors and associated spent fuel stores. Assistance will also be provided in the decommissioning of shutdown reactors.

In recent years, taking a new direction in its safety related services, the IAEA has carried out a number of radiological assessments of areas with radioactive residues from accidents and from past practices such as nuclear weapon testing and radioactive waste disposal. Such areas include some parts of the Kara and Barents Seas, the former nuclear test site near the city of Semipalatinsk (Kazakhstan), Bikini Atoll (Marshall Islands), and Mururoa and Fangataufa Atolls (France). The reports on these assessments have been published by the IAEA.

Another important issue over the past five years has been the safety of transport of radioactive materials. In an effort to assist its Member States to apply the IAEA's Transport Regulations more effectively and universally, the IAEA established a Transport Safety Appraisal Service (TranSAS) and provided training on the safe transport of radioactive materials. The IAEA also invited WHO, the European Commission, the Nuclear Energy Agency of the OECD, the International Air Transport Organization, and the International Federation of Airline Pilots Associations to work closely with it on matters relating to the safe transport of radioactive materials.

The IAEA continues to encourage research and development by supporting research contracts and agreements on a wide range of safety related subjects. At the beginning of 1998, there were almost 300 such contracts and agreements active on particular aspects of nuclear, radiation and radioactive waste safety.

Table 1 shows Regular Budget and extrabudgetary resources by major area of activity in 1999.

Area of Activity	Resources (US $ millions)		%
	Regular Budget	Extra-budgetary	
Nuclear Verification and Security of Material	80.0	11.2	38.3
Policy-making, Co-ordination and Support	66.3	2.7	29.0
Non-power Nuclear Applications	31.6	3.5	14.7
Nuclear, Radioactive and Waste Safety	14.0	3.0	7.1
Nuclear Power, Fuel Cycle & Waste Management	12.5	0.9	5.6
Management of Technical Co-operation	12.5	0.2	5.3
TOTAL	**216.9**	**21.5**	
GRAND TOTAL	**238.4**		**100**

Table 1. Regular Budget plus extrabudgetary resources (excluding TC) by major area of activity 1999.

V. CHALLENGES TO PEACEFUL CO-OPERATION

A. Changing times and new opportunities

In the past decade, political, economic, and technological developments have been major influences on the IAEA's work. They have presented new challenges and opportunities, requiring that the IAEA's plans and priorities be adjusted to changing realities.

Among the trends, challenges and opportunities that will influence the IAEA's course over the next five years are the following:

- The use of nuclear applications in developing countries is growing as local infrastructures improve and technology transfer increases.
- As the demand for electricity continues to increase and the drive for sustainable development gains momentum, the need to exploit energy sources with limited environmental impacts (in particular to meet commitments made in connection with the Kyoto Protocol) could revitalize the nuclear power option.
- In the context of global economic liberalization, leading to utility privatization, deregulation and diminishing State support for the nuclear power industry, there is a need to ensure that nuclear safety will not be compromised.
- As a result of the end of the Cold War, large amounts of nuclear material from the military sector became available to the civil sector, where large amounts of plutonium have already accumulated, with the attendant need for safety, security and safeguards. In addition, there is the prospect of a global ban on the production of fissile material for explosive purposes, which could entail major expansion of the IAEA's verification activities.
- As NPPs age and spent fuel and waste accumulate, more must be done to implement existing technical solutions for the management of spent fuel, for the disposal of radioactive waste and, where appropriate, for plant decommissioning and life optimization.
- Greater emphasis is being placed on the need for more effective verification of non-proliferation undertakings through strengthened safeguards covering both declared and undeclared nuclear material and activities.
- Civil society is acquiring an increasing role in shaping national and international policy, with the attendant need for enhanced and more open communication between the IAEA and the general public.
- Rapid and extensive advances in information technology will offer exceptional opportunities for new ways of working. In addition, new information technology will make better communication and outreach possible.

B. Goals and objectives 2001—2005

In 1999, against the background of these trends, challenges and opportunities, the IAEA adopted a **Medium Term Strategy** which establishes its goals and specific objectives for the five year period from 2001 to 2005 and specifies the means proposed to meet these objectives.

The objectives set by the IAEA for the medium term are grouped under three substantive goals or pillars that will continue to form a valid basis for its work, and two complementary functional goals to ensure efficient achievement of the substantive goals. The order in which the substantive goals are presented below does not imply any judgement as to their relative importance. They are complementary and interrelated.

In this approach, the first pillar discussed - technology - is broadly related to sustainable development and the transfer of technology, in particular through the TC programme.

1. Substantive goals

   A. Enhancement of the contribution of nuclear technologies towards meeting, in a sustainable manner, the needs and interests of Member States;

   B. A comprehensive and effective worldwide nuclear safety culture;

   C. Assurances to the international community of the peaceful use of nuclear material.

2. Functional goals

   A. Effective interaction with partners and the public;

   B. Excellence in management.

Since substantive goals A and B are directed at the implementation of the IAEA's promotional functions, which are relevant to the NPT Article IV, they are outlined below.

GOAL A: ENHANCEMENT OF THE CONTRIBUTION OF NUCLEAR TECHNOLOGIES TOWARDS MEETING, IN A SUSTAINABLE MANNER, THE NEEDS AND INTERESTS OF MEMBER STATES

The Member States have different interests in, needs for and attitudes towards the use of nuclear technologies, which themselves change over time. In addition, developments in other technical fields have had an impact - both positive and negative - on the comparative advantages of nuclear technologies.

The threefold challenge for the IAEA in the medium term is:

- to understand how the needs and interests of Member States are changing so as to be able to respond by focusing on the appropriate nuclear technologies;
- to contribute to the objective assessment of the use of nuclear technologies and to assist Member States in the safe application of those technologies that continue to have a comparative advantage;
- to play a catalytic role in the international effort to maintain and increase knowledge, understanding and expertise in the nuclear field, particularly through the collection and dissemination of scientific information and the transfer of technology.

Objective A.1: To identify and assess nuclear technologies which could be used to meet the needs and development goals of Member States.

Objective A.2: To achieve a more effective use of current applications of nuclear technologies in power and non-power fields.

Objective A.3: To support and facilitate the development of new and emerging applications of nuclear technologies in nuclear power and its fuel cycle, and in non-power areas.

Priorities in Goal A: The Statute considers Goal A to be a central part of the IAEA's work inasmuch as it has an impact on the economic and social development of Member States. Priorities

under Goal A, however, continue to evolve because of changes in development aims and the comparative advantage of nuclear vis-à-vis other technologies. With regard to non-power applications, the priorities will be attached — in line with different recommendations from programme appraisals — to increasing food production, fighting disease, managing water resources and monitoring and protecting the environment. With regard to nuclear power, first priority will be given to the back end of the nuclear fuel cycle, in particular to technological solutions to waste management problems and building international consensus on disposal of high level and long lived radioactive waste. Second priority will be given to small and medium size reactors and other innovative technologies, and third priority will be given to the potential role of nuclear energy in sustainable development. Needs and interests of Member States will be regularly evaluated in order to confirm these objectives and priorities.

GOAL B: A COMPREHENSIVE AND EFFECTIVE WORLDWIDE NUCLEAR SAFETY CULTURE

It is widely recognized today that a demonstrated high standard of nuclear, radiation and radioactive waste safety will be a determining factor for the future use of nuclear technology and that safety relies not only on good technology but, equally, on good regulatory practices and well qualified personnel. The achievement of a worldwide safety culture will be aided by the existence of effective international instruments prescribing the basic legal norms for the safe use of nuclear technology, internationally accepted standards, and assistance to States in their implementation.

The challenges to the goal of a comprehensive safety culture are:

- areas where adequate international regulation is lacking;
- IAEA standards that are not always up-to-date and areas where standards have not yet been formulated (e.g. the long term safety of radioactive waste repositories);
- inadequate implementation of standards (e.g. reactors built to earlier designs often do not meet the safety levels reflected in present-day standards);
- absence of universal acceptance of the safety review services developed by the IAEA.

Transparency and openness are important characteristics of the envisaged safety culture. For the IAEA, this implies supporting such openness in Member States and taking on a more active role in helping to raise awareness of safety issues.

Objective B.1: To strengthen and promote a system of international legally binding instruments and other formal commitments.

Objective B.2: To complete the development and update of standards in all areas of nuclear, radiation, transport and waste safety.

Objective B.3: To achieve more effective application of safety standards in Member States.

Objective B.4: To promote technological solutions for improving the safety of nuclear installations and of treatment, storage and disposal of high, intermediate and low level wastes and spent fuel.

Priorities in Goal B: The IAEA's objectives concerning safety related international instruments and safety standards will have high priority. The need for new international safety

related instruments will also be continuously assessed. In developing new safety standards, high priority is assigned to consensus building on criteria for the safety of repositories of high level/long lived waste. The current revision of the existing safety standards will be completed early in the medium term. This will pave the way for giving increased priority to application of these standards through the promotion of education and training programmes, the provision of advisory and review services and technical co-operation. Also, the IAEA will take steps to gain more universal acceptance of its safety services and ensure proper co-ordination of efforts in the safety field with relevant organizations. In this manner, the IAEA will effectively contribute to an international safety culture.

VI. CONCLUSION

The IAEA's activities related to Article IV of the NPT are many, diverse in scope but focused on priority needs of its Member States. These activities continue to enjoy interest and support from both donors and recipient countries although, due to its voluntary nature, the level of funding for these activities continues to be unpredictable.

Since the last NPT Review and Extension Conference in 1995, the IAEA has continued its efforts aimed at strengthening its role in the transfer of peaceful nuclear technologies to its developing Member States. A new TC strategy has been adopted and is now actively used in TC programming and implementation. Technical Departments have intensified activities in priority areas related to the transfer of nuclear technology to developing countries, especially in areas such as water resource management, environmental monitoring, radiation safety, and radioactive waste management.

Further improvement of the efficiency and effectiveness of the technology transfer activities is foreseen as a priority goal under the IAEA Medium Term Strategy covering the first five years of the 21st century. This will enhance the contribution of nuclear technologies towards meeting the needs and interests of a growing number of Member States.

As a result, the IAEA is expected to expand its role as the principal vehicle of multilateral co-operation in the peaceful use of nuclear energy.

ABBREVIATIONS

AFRA	African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology
APC	Assessed Programme Costs
ARCAL	Regional Co-operative Arrangements for the Promotion of Nuclear Science and Technology in Latin America
BSS	International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources
CPF	Country programme framework
CRP	Co-ordinated research project
FAO	Food and Agricultural Organization
IAEA	International Atomic Energy Agency
ICTP	International Centre for Theoretical Physics (Trieste, Italy)
INIS	International Nuclear Information System
NIS	Newly Independent States (of the former USSR)
NPP	Nuclear Power Plant
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
OECD	Organisation for Economic Co-operation and Development
PRIS	Power Reactor Information System
RBMK	Light water cooled graphite moderated reactor (Soviet design)
RCA	Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (for Asia and the Pacific)
RSA	Revised Supplementary Agreement concerning the provision of technical assistance
SIT	Sterile insect technique
TC	Technical Co-operation
TCDC	Technical Co-operation among Developing Countries
TCF	Technical Co-operation Fund
TranSAS	Transport Safety Appraisal Service
WANO	World Association of Nuclear Operators
WHO	World Health Organization
WWER	Water cooled water moderated energy reactor (Soviet design)